



Hot strip


Thanks to its outstanding properties, hot-rolled strip meets even the most stringent requirements in terms of technological characteristics, surface condition, and dimensional accuracy. These properties make hot strip ideal for downstream processing and numerous end products such as stampings and drawn parts, tubes, car wheels or even agricultural implements and shelf systems.

Surface finishes
pickled/unpickled

Surface treatments
oiled/unoiled

Edge finishes
mill edge
cut edge

Tolerances
Dimensional and shape tolerances to DIN EN 10 051. Closer tolerances by arrangement.

Selected grades also available with closer thickness tolerances in the form of scalur® (see page 19) or from the Basque Mungia as  in accordance with DIN EN 10 140.

Mild non-alloy steel for cold forming · DIN EN 10 111

Steel type			Mechanical properties, transverse							Chemical composition, heat analysis			
Short designation	VDA239-100	Material number	Lower yield strength R_{eL} ¹⁾ MPa		Tensile strength R_m MPa max.	Elongation at fracture A_{80} % min.			Elongation at fracture A_5 % min.	Percentage by weight % max.			
			1.0 mm ≤ e < 2 mm	2 mm ≤ e < 11 mm		1.0 mm ≤ e < 1.5 mm	1.5 mm ≤ e < 2 mm	2 mm ≤ e < 3 mm		3 mm ≤ e < 11 mm	C	Mn	P
DD11	–	1.0332	170–360	170–340	440	22	23	24	28	0.12	0.60	0.045	0.045
DD12	–	1.0398	170–340	170–320	420	24	25	26	30	0.10	0.45	0.035	0.035
DD13	–	1.0335	170–330	170–310	400	27	28	29	33	0.08	0.40	0.030	0.030
DD14	HR2	1.0389	170–310	170–290	380	30	31	32	36	0.08	0.35	0.025	0.025

1) Where the upper yield strength is not defined, $R_{e0.2}$ shall be applicable instead of R_{eL} .

Also available with closer thickness tolerances in the form of scalar® (see page 19) or from the Basque Mungia as  in accordance with DIN EN 10 140.

Non-alloy/general structural steel · DIN EN 10 025-2

Steel type			Mechanical properties, transverse ¹⁾								
Short designation	VDA239-100	Material number	Upper yield strength R_{eH} MPa min.	Tensile strength R_m MPa	Elongation at fracture A_{80} % min.					Elongation at fracture A_5 % min.	
					e ≤ 16 mm	e < 3 mm	3 mm ≤ e ≤ 16 mm	e ≤ 1 mm	1 mm < e ≤ 1.5 mm		1.5 mm < e ≤ 2 mm
S235JR	–	1.0038	235	360–510	360–510	15	16	17	18	19	24
S235J0	–	1.0114	235	360–510	360–510	15	16	17	18	19	24
S235J2	–	1.0117	235	360–510	360–510	15	16	17	18	19	24
S275JR	–	1.0044	275	430–580	410–560	13	14	15	16	17	21
S275J0	–	1.0143	275	430–580	410–560	13	14	15	16	17	21
S275J2	–	1.0145	275	430–580	410–560	13	14	15	16	17	21
S355JR	–	1.0045	355	510–680	470–630	12	13	14	15	16	20
S355J0	–	1.0553	355	510–680	470–630	12	13	14	15	16	20
S355J2	–	1.0577	355	510–680	470–630	12	13	14	15	16	20
S355K2	–	1.0596	355	510–680	470–630	12	13	14	15	16	20

Steel type			Chemical composition, heat analysis						
Short designation	VDA239-100	Material number	Percentage by weight % max.						
			C	Si	Mn	P	S	N	Cu
S235JR	–	1.0038	0.17	–	1.40	0.035	0.035	0.012	0.55
S235J0	–	1.0114	0.17	–	1.40	0.030	0.030	0.012	0.55
S235J2	–	1.0117	0.17	–	1.40	0.025	0.025	–	0.55
S275JR	–	1.0044	0.21	–	1.50	0.035	0.035	0.012	0.55
S275J0	–	1.0143	0.18	–	1.50	0.030	0.030	0.012	0.55
S275J2	–	1.0145	0.18	–	1.50	0.025	0.025	–	0.55
S355JR	–	1.0045	0.24	0.55	1.60	0.035	0.035	0.012	0.55
S355J0	–	1.0553	0.20	0.55	1.60	0.030	0.030	0.012	0.55
S355J2	–	1.0577	0.20	0.55	1.60	0.025	0.025	–	0.55
S355K2	–	1.0596	0.20	0.55	1.60	0.025	0.025	–	0.55

1) As rolling widths ≥ 600 mm are primarily used, transverse values generally apply, refer to DIN EN 10 025-2.

Thermomechanically rolled steel for cold working · DIN EN 10 149-2

Steel type		Mechanical properties, longitudinal					Chemical composition, heat analysis										
Short designation	VDA239-100	Material number	Upper yield strength $R_{eH}^{1)}$ MPa min.	Tensile strength R_m MPa	Elongation at fracture A_{80} % min.	Elongation at fracture A_5 % min.	Percentage by weight % max.										
							C	Mn	Si	P	S	Al _{total} min.	Nb	V	Ti	Mo	B
S315MC	HR300LA	1.0972	315	390–510	20	24	0.12	1.30	0.50	0.025	0.020	0.015	0.09 ²⁾	0.20 ²⁾	0.15 ²⁾	–	–
S355MC	HR340LA	1.0976	355	430–550	19	23	0.12	1.50	0.50	0.025	0.020	0.015	0.09 ²⁾	0.20 ²⁾	0.15 ²⁾	–	–
S420MC	HR420LA	1.0980	420	480–620	16	19	0.12	1.60	0.50	0.025	0.015	0.015	0.09 ²⁾	0.20 ²⁾	0.15 ²⁾	–	–
S460MC	HR460LA	1.0982	460	520–670	14	17	0.12	1.60	0.50	0.025	0.015	0.015	0.09 ²⁾	0.20 ²⁾	0.15 ²⁾	–	–
S500MC	HR500LA	1.0984	500	550–700	12	14	0.12	1.70	0.50	0.025	0.015	0.015	0.09 ²⁾	0.20 ²⁾	0.15 ²⁾	–	–
S550MC	HR550LA	1.0986	550	600–760	12	14	0.12	1.80	0.50	0.025	0.015	0.015	0.09 ²⁾	0.20 ²⁾	0.15 ²⁾	–	–
S600MC	–	1.8969	600	650–820	11	13	0.12	1.90	0.50	0.025	0.015	0.015	0.09 ²⁾	0.20 ²⁾	0.22 ²⁾	0.50	0.005
S650MC	–	1.8976	650	700–880	10	12	0.12	2.00	0.60	0.025	0.015	0.015	0.09 ²⁾	0.20 ²⁾	0.22 ²⁾	0.50	0.005
S700MC	HR700LA	1.8974	700	750–950	10	12	0.12	2.10	0.60	0.025	0.015	0.015	0.09 ²⁾	0.20 ²⁾	0.22 ²⁾	0.50	0.005

1) For thicknesses > 8 mm the yield strength values may be 20 MPa lower.

2) The combined content of Nb, V and Ti must not exceed 0.22 %.

Also available with closer thickness tolerances in the form of scalur® (see page 19) or from the Basque Mungia as  in accordance with DIN EN 10 140.

Multiphase steel · DIN EN 10 338

Steel type		Mechanical properties, longitudinal					Chemical composition, heat analysis										
Short designation	VDA239-100	Material number	Proof stress $R_{p0.2}$ MPa	Tensile strength R_m MPa min.	Elongation at fracture A_{80} % min.	Elongation at fracture A_5 % min.	Percentage by weight % max.										
							C	Si	Mn	P	S	Al _{total (span)}	Cr+Mo	Nb+Ti	V	B	
Ferrite-bainite-phase steel																	
HDT450F	HR300Y450T-FB	1.0961	300–420	450	24	27	0.18	0.50	2.00	0.050	0.010	0.015–2.0	1.00	0.15	0.15	0.005	
HDT580F	HR440Y580T-FB	1.0994	460–620	580	15	17	0.18	0.50	2.00	0.050	0.010	0.015–2.0	1.00	0.15	0.15	0.010	
Dual-phase steel																	
HDT580X	HR330Y580T-DP	1.0936	330–450	580	19	23	0.14	1.00	2.20	0.085	0.015	0.015–0.1	1.40	0.15	0.20	0.005	
Complex-phase steel																	
HDT760C	HR660Y760T-CP	1.0998	660–830	760	10	12	0.18	1.00	2.50	0.080	0.015	0.015–2.0	1.00	0.25	0.20	0.005	
CP-W®1000 ¹⁾ (transverse)		1.0954	720–920	950	9	12	0.23	0.80	2.20	0.080	0.015	≤ 2	1.20	0.15	0.20	0.005	
Martensitic steel																	
HDT1180G1	HR900Y1180T-MS	1.0960	900–1,200	1,180	4	5	0.25	0.80	2.50	0.060	0.015	0.015–2.0	1.20	0.25	0.22	0.005	

1) Special mill grade

Where particularly close thickness tolerances of up to ± 0.05 mm are required, we recommend our product scalur®. Other grades on request.

scalur®

scalur® from thyssenkrupp is a pickled hot strip with extremely tight thickness tolerances down to ± 0.05 mm over its entire length and width. It also possesses particularly uniform properties and a homogeneous microstructure, ensuring excellent processing characteristics and consistently high product quality. Depending on strength, scalur® is available in thicknesses of 1.20 to 9.00 mm and widths of 900 to 1,600 mm. It is particularly suitable for stampings as used in seat belt retractor housings, seat belt buckles, profiles and parts for car seats.

scalur® – pickled hot strip with very close thickness tolerances

Low-carbon steel · DIN EN 10 111				Structural steel · DIN EN 10 025-2				Thermomechanically treated steel · DIN EN 10 149-2			
Short designation	Standard designation	VDA239-100	Material number	Short designation	Standard designation	VDA239-100	Material number	Short designation	Standard designation	VDA239-100	Material number
scalur®DD11	DD11	–	1.0332	scalur®S235JR	S235JR ¹⁾	–	1.0038	scalur®S315MC	S315MC	HR300LA	1.0972
scalur®DD12	DD12	–	1.0398	scalur®S235J0	S235J0 ¹⁾	–	1.0114	scalur®S355MC	S355MC	HR340LA	1.0976
scalur®DD13	DD13	–	1.0335	scalur®S235J2	S235J2 ¹⁾	–	1.0117	scalur®S420MC	S420MC	HR420LA	1.0980
scalur®DD14	DD14	HR2	1.0389					scalur®S460MC	S460MC	HR460LA	1.0982
								scalur®S500MC	S500MC	HR500LA	1.0984
								scalur®S550MC	S550MC	HR550LA	1.0986
								scalur®S600MC	S600MC	–	1.8969
								scalur®S650MC	S650MC	–	1.8976
								scalur®S700MC	S700MC	HR700LA	1.8974

1) Supplied in the as-rolled condition (+AR, "as rolled")

All chemical and mechanical properties of the grades mentioned are analog to the properties described for hot strip.